



SEQUENCE LISTING

<110> Heinrichs, Jon
Johnson, Leslie S.
Koenig, Scott
Adamou, John E.

<120> Pneumococcal Protein Homologs and Fragments for
Vaccines

<130> 469201-493

<140> U.S. 09/645,835

<141> 2000-08-25

<150> U.S. 60/150,750

<151> 1999-08-25

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<170> PatentIn Ver. 2.1

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<213> Streptococcus pyogenes

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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
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Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile
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Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln
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Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr
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Arg Pro Thr Pro Ala Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro
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Lys His Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu
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 65 70 75 80
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 85 90 95
 His Ser His Phe Ile Phe Tyr Ala Asp Leu Lys Gly Ser Pro Phe Glu
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 Tyr Leu Ile Pro Lys Gly Ala Ser Leu Ala Lys Pro Ala Val Ala Gln
 115 120 125
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 Thr Val Arg His Asp Asp His Phe His Tyr Ile Leu Lys Ser Ser Leu
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 Ser Gly Gln Thr Gln Ala Gln Ala Lys Gln Val Ala Thr Arg Leu Pro
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 Val Gly Val Thr Lys Asp Ser Ile Leu Val Asp His Asp Gly His Leu
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 245 250 255

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His Gln Thr Pro Glu Leu Ser Glu Arg Glu Lys Glu Tyr Gln Glu Lys
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Arg Val Glu Thr Gln Asp Gly Lys Leu Gly Leu Glu Tyr Pro His His
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Ser Leu Leu Pro Asn Leu Glu Thr Leu Gly Ile Gly Phe Thr Pro Ile
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Lys Asp Ile Ser Pro Val Leu Gln Phe Lys Lys Leu Lys Gln Leu Leu
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Met Thr Lys Thr Gly Val Thr Asp Tyr Arg Phe Leu Asp Asn Met Pro
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Gln Leu Glu Gly Ile Asp Ile Ser Gln Asn Asn Leu Lys Asp Ile Ser
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Gly Ser Met Val Gly Asn Gly Thr Ala Glu Glu Lys Ala Ala Met Ala
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Thr Lys Ala Lys Glu Ser Ala Gln Glu Ala Ser Glu Ser His Asp Tyr
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Asn His Asn His Thr Tyr Glu Asp Glu Glu Gly His Ala His Glu His
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<213> Streptococcus agalactiae

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Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
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Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
85 90 95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr
115 120 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser
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Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala
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Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His
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370 375 380

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Thr Phe Leu Gly His Arg Ile Lys Ala Tyr Gly Lys Gly Leu Asp Gly
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Lys Pro Tyr Asp Thr Ser Asp Ala Tyr Val Phe Ser Lys Glu Ser Ile
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435 440 445

His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val
His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val
450 455 460

Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala
Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala
465 470 475 480

Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys
Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys
485 490 495

Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro
Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro
500 505 510

Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr
Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr
515 520 525

Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His
Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His
530 535 540

Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val
Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val
545 550 555 560

Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr
Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr
565 570 575

Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro
Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro
580 585 590

Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met
Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met
595 600 605

Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu
Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu
610 615 620

Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala
Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala
625 630 635 640

Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys
Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys
645 650 655

Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp
Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp
660 665 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
675 680 685

Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys
 690 695 700
 Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala
 705 710 715 720
 Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys
 725 730 735
 Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser
 740 745 750
 Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr
 755 760 765
 Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln
 770 775 780
 Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val
 785 790 795 800
 Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr
 805 810 815
 Leu Gln Gln Ile Asn Pro
 820

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 <211> 816
 <212> PRT
 <213> Streptococcus pneumoniae

<400> 7
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 Leu Ser Val Cys Ser Tyr Glu Leu Gly Leu Tyr Gln Ala Arg Thr Val
 20 25 30
 Lys Glu Asn Asn Arg Val Ser Tyr Ile Asp Gly Lys Gln Ala Thr Gln
 35 40 45
 Lys Thr Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly Ile
 50 55 60
 Asn Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val Thr

325 330 335

Tyr Ser Gln Met Ser Glu Leu Glu Glu Arg Ile Ala Arg Ile Ile Pro
340 345 350

Leu Arg Tyr Arg Ser Asn His Trp Val Pro Asp Ser Arg Pro Glu Gln
355 360 365

Pro Ser Pro Gln Pro Thr Pro Glu Pro Ser Pro Gly Pro Gln Pro Ala
370 375 380

Pro Asn Leu Lys Ile Asp Ser Asn Ser Ser Leu Val Ser Gln Leu Val
385 390 395 400

Arg Lys Val Gly Glu Gly Tyr Val Phe Glu Glu Lys Gly Ile Ser Arg
405 410 415

Tyr Val Phe Ala Lys Asp Leu Pro Ser Glu Thr Val Lys Asn Leu Glu
420 425 430

Ser Lys Leu Ser Lys Gln Glu Ser Val Ser His Thr Leu Thr Ala Lys
435 440 445

Lys Glu Asn Val Ala Pro Arg Asp Gln Glu Phe Tyr Asp Lys Ala Tyr
450 455 460

Asn Leu Leu Thr Glu Ala His Lys Ala Leu Phe Glu Asn Lys Gly Arg
465 470 475 480

Asn Ser Asp Phe Gln Ala Leu Asp Lys Leu Leu Glu Arg Leu Asn Asp
485 490 495

Glu Ser Thr Asn Lys Glu Lys Leu Val Asp Asp Leu Leu Ala Phe Leu
500 505 510

Ala Pro Ile Thr His Pro Glu Arg Leu Gly Lys Pro Asn Ser Gln Ile
515 520 525

Glu Tyr Thr Glu Asp Glu Val Arg Ile Ala Gln Leu Ala Asp Lys Tyr
530 535 540

Thr Thr Ser Asp Gly Tyr Ile Phe Asp Glu His Asp Ile Ile Ser Asp
545 550 555 560

Glu Gly Asp Ala Tyr Val Thr Pro His Met Gly His Ser His Trp Ile
565 570 575

Gly Lys Asp Ser Leu Ser Asp Lys Glu Lys Val Ala Ala Gln Ala Tyr

580	585	590
Thr Lys Glu Lys Gly Ile Leu Pro Pro Ser Pro Asp Ala Asp Val Lys		
595	600	605
Ala Asn Pro Thr Gly Asp Ser Ala Ala Ala Ile Tyr Asn Arg Val Lys		
610	615	620
Gly Glu Lys Arg Ile Pro Leu Val Arg Leu Pro Tyr Met Val Glu His		
625	630	640
Thr Val Glu Val Lys Asn Gly Asn Leu Ile Ile Pro His Lys Asp His		
645	650	655
Tyr His Asn Ile Lys Phe Ala Trp Phe Asp Asp His Thr Tyr Lys Ala		
660	665	670
Pro Asn Gly Tyr Thr Leu Glu Asp Leu Phe Ala Thr Ile Lys Tyr Tyr		
675	680	685
Val Glu His Pro Asp Glu Arg Pro His Ser Asn Asp Gly Trp Gly Asn		
690	695	700
Ala Ser Glu His Val Leu Gly Lys Asp His Ser Glu Asp Pro Asn		
705	710	720
Lys Asn Phe Lys Ala Asp Glu Glu Pro Val Glu Glu Thr Pro Ala Glu		
725	730	735
Pro Glu Val Pro Gln Val Glu Thr Glu Lys Val Glu Ala Gln Leu Lys		
740	745	750
Glu Ala Glu Val Leu Leu Ala Lys Val Thr Asp Ser Ser Leu Lys Ala		
755	760	765
Asn Ala Thr Glu Thr Leu Ala Gly Leu Arg Asn Asn Leu Thr Leu Gln		
770	775	780
Ile Met Asp Asn Asn Ser Ile Met Ala Glu Ala Glu Lys Leu Leu Ala		
785	790	800
Leu Leu Lys Gly Ser Asn Pro Ser Ser Val Ser Lys Glu Lys Ile Asn		
805	810	815